

DSF1d 1860/2482

ChemRisk/Shonka Research Associates, Inc., Document Request Form

(This section to be completed by subcontractor requesting document)

JK Lamb / K-25 1034A
Requestor Document Center (is requested to provide the following document)

Date of request 6/22/95 Expected receipt of document 7/15/95

Document number A-4746 Date of document 8/6/47

Title and author (if document is unnumbered)

(This section to be completed by Document Center)

Date request received 6/27/95

Date submitted to ADC 6/30/95

Date submitted to HSA Coordinator 6/27/95

(This section to be completed by HSA Coordinator)

Date submitted to CICO 6/30/95 7/17/95

Date received from CICO 7/17/95

Date submitted to ChemRisk/Shonka and DOE 7/17/95

(This section to be completed by ChemRisk/Shonka Research Associates, Inc.)

Date document received _____

Signature _____

SANITIZED VERSION OF MONTHLY PROGRESS REPORT JULY 1947

(Sanitized Version of CRD Document A-4746, dated August 4, 1947)

Compiled by
S. G. Thornton
Environmental Management Division
OAK RIDGE K-25 SITE
for the Health Studies Agreement

July 1995

Oak Ridge K-25 Site
Oak Ridge, Tennessee 37831-7314
managed by
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the U.S. DEPARTMENT OF ENERGY
under Contract DE-AC05-84OR21400

This document has been approved for release
to the public by:

DN Hall for
as 2nd
Technical Information Officer *(23)* Date *7/17/95*
Oak Ridge K-25 Site

~~CONFIDENTIAL~~

INVENTORIED

AUG 6 1951

By *[Signature]*

This document consists of 21
pages, No. 37 of 37 copies,
Series A

Report number: A-1746 *

INVENTORIED
AUG 6 1952
By *[Signature]*

CARBIDE AND CARBON CHEMICALS CORPORATION

OAK RIDGE, TENNESSEE

August 6, 1947

Engineering Division

Instrument Engineering Department

Design and Development

MONTHLY PROGRESS REPORT

July-1947

DISTRIBUTION LIST

H. L. Barnett
S. C. Barnett
R. M. Batch
Dr. C. K. Beck
E. M. Blacksher
K. E. Burmaster
Dr. A. D. Callihan
C. E. Center
J. A. Connors
S. Cromer (2)
A. P. Dunlap
A. P. Huber
W. B. Humes
Dr. F. W. Hurd
N. L. Isenhour
W. N. Jennings
R. G. Jordan

R. B. Korsmeyer
L. F. Lieber
J. H. Lykins
J. R. Mahoney
J. A. Marshall
M. F. Schwenn
M. P. Seyfried
G. T. E. Sheldon
R. J. Thomas
R. W. Ulm
P. R. Vanstrum
S. Visner
R. A. Walker
R. M. Williams
L. C. Willson
Plant Records (2)
Technical Library (2)

021

REMAINS: GRD

Classification changed to: (level and category)

ADC or ADD signature (first review)

ADJ signature (final review)

Date

Not Required

rec # 11266

This document contains information affecting the
National Defense of the United States within the
meaning of the Espionage Act, U. S. C. 50: 31 and
32. Its transmission or the revelation of its
contents in any manner to an unauthorized person
is prohibited by law.

~~CONFIDENTIAL~~

Confidential undocumental

CLASSIFICATION CHANGED TO

By *W. S. Harwell* on 3-23-54

By *W. S. Harwell* Date 5-5-54

** See X/EM-146 for unclassified*

Cy #1

CONFIDENTIAL

ENGINEERING DIVISION

Instrument Engineering Department

Design and Development

MONTHLY PROGRESS REPORT

July-1947

ABSTRACTS:

In order that this report be able to reflect all the design and development work being done by this Department, the classification has been raised to Confidential and that portion of the work that would be classified higher than Restricted has been included. The July report reflects all of the work that is included on the program whether it be active or inactive at the present.

The work on the Building Datum Accuracy problem is progressing satisfactorily. It is felt that an absolute accuracy of $\pm .005$ psi can be obtained as soon as a method has been developed to minimize the effect of temperature on the suppressed range pressure transmitters. An attempt is being made to develop a primary standard with an accuracy of $\pm .001$ psi for use in checking the Building Datum Test Wagons.

Prints for the construction of the all metal tube rack are essentially complete. A master print list is now being made up which will contain the details included on each print, their B/M number, and the jigs required for their construction. The only other remaining items are revisions on prints which have been issued.

A Line Recorder sample leak which is automatically adjusted to maintain constant sample flow has been installed on a tube rack and is now operating in Building K-305-7. To date, its operation has been satisfactory even during periods of rapid building pressure change.

The first model of the argon ionization chamber radiation monitor has been in operation for some time. The zero drift and stability of calibration have been quite satisfactory; however, battery life and sensitivity still require some improvement. An attempt is being made to substitute a

CONFIDENTIAL

C O N F I D E N T I A L

ABSTRACTS (Continued):

vibrator power supply for the most of the batteries and the second unit will be of higher sensitivity.

W. L. Isenhour

W. L. Isenhour

Supervisor, Instrument Engineering Dept.

J. R. Mahoney

J. R. Mahoney

Asst. Responsible for Electronic Engineering

/jms

C O N F I D E N T I A L

~~CONFIDENTIAL~~

SUMMARY

Instrument Engineering Department

MONTHLY PROGRESS REPORT

July-1947

A. SPECIAL PROJECT SUMMARY

Number on hand July 1, 1947	51 *
Number received during month	2
Number completed during month	0
Number on hand August 1, 1947	53
Number under study during month	34

* - Corrected to include problems that are classified Confidential

B. TRAINING CLASS SUMMARY

Thirty-six (36) mechanics attended one thousand two hundred sixty-one (1261) class hours.

~~CONFIDENTIAL~~

CONFIDENTIAL

INDEX

INSTRUMENT ENGINEERING DEPARTMENT

MONTHLY PROGRESS REPORT

July-1947

N. L. Isenhour

PART I	INSTRUMENT DEVELOPMENT SECTION- J. T. DALTON	Page <u>5</u>
PART II	ELECTRONIC INSTRUMENT ENGINEERING SECTION- W. G. S. FORT	Page <u>11</u>
PART III	MECHANICAL INSTRUMENT ENGINEERING SECTION- B. B. BELL	Page <u>17</u>

CONFIDENTIAL

C O N F I D E N T I A L

PART I

INSTRUMENT DEVELOPMENT SECTION

MONTHLY PROGRESS REPORT

July-1947

A. LINE RECORDER IMPROVEMENTS

S-191

PIRANI CONTROLLED LEAK

Requested by L. L. Forward, September 6, 1946, Instrument Division.

Problem:

To automatically control the flow of sample, at a constant value to the line recorder tube. (Details in November, 1946 Report).

Progress:

A tube rack containing the Pirani controlled Dalton leak apparatus was installed in line recorder station 305-7. The results obtained are being compared to that of standard tube rack in the same station, the gas sample to each of the racks is obtained from the same source. The Micromax print of the Pirani had held to within approximately one-half division of the control point and no increase in scatter in printing of other signals was noted. Work is continuing on improving the mechanical and electronic control system in a second experimental unit.

S-192

ALL METAL ION GAGE

Requested by L. L. Forward, August 16, 1946, Instrument Division.

Problem:

To develop a metal ion gage so that it may be possible to eliminate the last of the glass components in the line recorder tube rack.

Progress:

The metal ion gages undergoing tests in the field and the Shop are continuing to perform satisfactorily. No additional electrical leakage problems have been noted since the design of the press seal was revised and the protective shields were added to the electrodes and supports of the plate and filament.

S-194

INCREASE TUBE SOURCE LIFE

Requested by J. R. Mahoney, September 4, 1946, Engineering Division.

Problem:

To investigate methods of increasing source life by possible improvement in the welding and forming of the source filament and to study methods of installation of the leads and connectors at the source to reduce source failure due to electrical leakage.

C O N F I D E N T I A L

CONFIDENTIAL

PART I

A. LINE RECORDER IMPROVEMENTS (Continued)

Progress: Recommendations have been made that jigs for welding and forming of filaments be fabricated; at present work is continuing on the improving of the source assembly for the metal line recorder tube.

S-198 CONTAMINATION OF INLET SECTION OF PRE-CALIBRATED TUBE RACK
Requested by J. R. Mahoney, April 24, 1947, Engineering Division.

Problem: To determine a desirable method of reducing the chances of the pre-calibrated inlet system of the tube from being contaminated by fore-pump oil.

Progress: Life tests are continuing of the carbon traps which were installed in the evacuation lines of the inlet systems of two tube racks. The effectiveness of the traps will be determined after more extensive tests have been completed.

S-200 METAL LINE RECORDER TUBE
Requested by L. L. Forward, December 6, 1945, Instrument Division.

Problem: To develop an all metal line recorder tube to replace the glass tube now in service. The employment of a metal tube will result in a saving in maintenance costs since the breakage of tube envelopes will be eliminated and the methods of replacing and repairing sources will be improved.

Progress: The manufacturing drawings have been completed and submitted for approval. Methods of welding, assembling, and baking out are being analyzed so that time required in conditioning may be reduced.

S-201 STAINLESS STEEL ANALYZER TUBE
Requested by J. R. Mahoney, July 3, 1947, Engineering Division.

Problem: To develop an analyzer tube of stainless to replace the copper section of the line recorder tube. The copper tube is not satisfactory because of the difficulty encountered in keeping it properly aligned in the main magnet and to the source assembly.

Progress: Two models were fabricated and at present one is undergoing tests in a tube rack which is "on stream" in the Process Area. The second, the improved model, has been installed in a tube rack and is nearly ready for testing.

CONFIDENTIAL

PART I

A. LINE RECORDER IMPROVEMENTS (Continued)

S-205

PHILLIPS ION GAGE

Requested by L. L. Forward, October 17, 1946, Instrument Division.

Problem:

To develop a gage that would replace the Pirani Gage now employed in line recorder operation. The response of the Pirani is slow and it is also costly to maintain. (Details in November, 1946 Report).

Progress:

Fabrication of a gage with a stainless steel envelope has been started and preparations for testing of the element are underway.

S-207

MECHANICAL REFRIGERATED LINE RECORDER TUBE RACK

Requested by A. P. Huber, June 17, 1946, Process Division.

Problem:

To apply mechanical refrigeration to the line recorder tube rack so that it would be possible to refrigerate the diffusion pump trap and the chemical trap. The use of mechanical refrigeration would effect savings in operational costs since the liquid nitrogen, for the pump trap and dry ice and trichlorethylene for the chemical trap would be eliminated.

Progress:

A new design of heat exchanger and inlet-suction connection assembly has been installed on one of the line recorder cold traps and preparations are now being made for testing of the part.

S-210

METAL DIFFUSION PUMP AND TRAP

Requested by L. L. Forward, January 4, 1946, Instrument Division.

Problem:

To develop a metal pump and trap for the line recorder tube rack so that the expense resulting from breakage of the glass traps and pumps may be eliminated. The problem of mercury migration to the cold trap is also to be investigated and provisions made for reducing or eliminating this undesirable characteristic.

Progress:

The manufacturing drawings for the pump and a trap for use with mechanical refrigeration were submitted for approval.

S-211

IMPROVEMENTS OF FILAMENTS FOR ION GAGE AND TUBE SOURCE

Requested by R. A. Walker, June 15, 1947, Process Division.

C O N F I D E N T I A L

PART I

A. LINE RECORDER IMPROVEMENTS (Continued)

Problem: To investigate the possibility of improving the performance and life of the ion gage and tube source filaments by using an oxide coated tungsten or a tungsten alloy wire.

Progress: Investigation of improving filament life by using a tungsten alloy is being held up until additional information is received from outside sources.

S-212 CATHODE RAY SCREEN FOR CHECKING METAL TUBE SOURCE ALIGNMENT
Requested by J. R. Mahoney, June 16, 1947, Engineering Division.

Problem: To conduct an investigation to determine the feasibility of employing a cathode ray screen for pre-installation chocking of tube sources so that any necessary adjustments would be made to improve alignment and resolution.

Progress: This problem is on the inactive list.

S-217 NEW LEAK DESIGN
Requested by L. L. Forward, March 6, 1946, Instrument Division.
(Now project number assigned December 3, 1946).

Problem: To develop an adjustable leak that would reduce some of the present Maintenance problems and also be of improved range and control. (Details in November, 1946 Report - See S-77).

Progress: Testing of the new leak with the Pirani controlled unit is in progress. Experiments are continuing to determine an optimum diaphragm thickness and also a desirable clearance between the diaphragm and the base to ensure meeting flow requirements.

B. LINE RECORDER SPECIAL APPLICATIONS

S-208 ALL METAL HF ANALYZER TUBE
Requested by J. A. Marshall, June 12, 1946, Process Division.

Problem: To develop an all metal tube for HF analysis. The metal HF tube would be desirable inasmuch as the standard line recorder tubes are being converted from glass to metal.

Progress: Due to failure of the source filament the unit was removed from service and is now in the Shop for repairs.

C O N F I D E N T I A L

C O N F I D E N T I A L

PART I

C. SPECIAL INSTRUMENTS

S-184

X-RAY INSTRUMENT FOR "T" ANALYSIS

Requested by G. T. E. Sheldon, November 18, 1946, Process Division.

Problem:

To determine if suitable methods and equipment may be developed to determine the quantitative change of "T", or the possible detection of "T", in plant equipment.

Progress:

Repairs to the first monitor were made and the instrument was tested. The second or spare monitor was assembled and is now undergoing tests. Indications are that a second field test, on the same drum that has been previously checked, will be possible about the first week in August.

S-195

ACCURATE PRESSURE RECORDER

Requested by N. L. Isenhour, September 6, 1946, Engineering Division.

Problem:

To develop a pressure recorder so designed that differences of one thousandth of a pound may be noted.

Progress:

This project is on the inactive list.

S-196

ACCURATE TEMPERATURE RECORDER

Requested by N. L. Isenhour, September 6, 1946, Engineering Division.

Problem:

To develop an accurate temperature recorder to be used primarily in laboratory work where possibly a hundredth of degree may be taken into account.

Progress:

This project is on the inactive list.

S-197

INFRA-RED ANALYZER FOR HF

Requested by L. Z. Morris, September 5, 1946, Laboratory Division.

Problem:

To develop a Baird Associates Infra-Red Analyzer so that it may be employed as an HF analysis instrument. (Details in November, 1946 Report).

Progress:

Trimmers for equalizing the light from the source were installed and tests indicate the desired results are being obtained. The 200 watt projection lamp at the source was replaced by one of 500 watts and a number of tests were made at varied voltages until an optimum operating range was determined.

C O N F I D E N T I A L

~~CONFIDENTIAL~~

PART I

C. SPECIAL INSTRUMENTS (Continued)

A pair of bolometers having less core area and fewer supports are being wound for the Infra-Red Analyzer. The new components when installed may aid in reducing the response time and also help to increase sensitivity. Since the mirrors to be installed in the new optical system have not been received, all tests are continuing to be made with the temporary system.

S-193

CONTINUOUS FISSION COUNTER

Requested by J. R. Mahoney, November 1, 1946, Engineering Division.

Problem:

To improve the Fission Counter so that its operation may be continuous and possibly automatic. (Details in November, 1946 Report).

Progress:

This problem on the inactive list.

~~CONFIDENTIAL~~

CONFIDENTIAL

PART II

ELECTRONIC INSTRUMENT ENGINEERING SECTION

MONTHLY PROGRESS REPORT

July-1947

A. LINE RECORDER IMPROVEMENTS

S-23-A

CHEMICAL TRAP DESIGN CHANGE (HF 201 - 21523)-

Requested by L. F. Lieber, February 4, 1946, Maintenance Division.

Problem: To modify the design of the present trap to give longer life and to withstand greater pressure surges.

Progress: All the chemical traps made according to the proposed design are still in service on the floor.

S-216

L. R. SOURCE CONTAMINATION BY 816 (HF 201 - 177871)-

Requested by M. F. Schwenn, November 22, 1946, Process Division.

Problem: To determine whether the heated trap type of source as used in HF tube racks will extend the life of standard tube racks in sections of the cascade where the C-816 concentration is high. (Details in November, 1946 Report).

Progress: The racks in 306-6 and 305-6 are still in operation. Since changing the beads on the source leads, it has been noticed that the changes in calibration have not been as erratic as they were formerly. A black deposit is forming on the inside of the spectrometer tube in 306-6. When the rack fails, it is planned to request a chemical analysis of this material since it may contain a clue to the affect of 816 on the source.

S-217-A

NEW DALTON LEAK INSTALLATION (HF 201 - 177886)-

Requested by J. R. Mahoney, December 19, 1946, Engineering Division.

Problem: To design necessary mounting facilities for replacement of G. E. leaks with leaks of the new design and to follow their performance in the field in order to determine whether further improvement can be made. (Details in December, 1946 Report, S-204-A).

Progress: Since none of the new type leaks in service have required maintenance, no further work has been done on this problem during the past month.

CONFIDENTIAL

C O N F I D E N T I A L

PART II

A. LINE RECORDER IMPROVEMENTS (Continued)

S-218

PRE-CALIBRATED, ALL METAL, MECHANICALLY REFRIGERATED TUBE RACKS (HF 201 - 177873)-

Requested by N. L. Isenhour, December 4, 1946, Engineering Division.

Problem:

To design and field test an all metal, mechanically refrigerated line recorder tube rack. (Details in November, 1946 Report).

Progress:

Three of the all metal mechanically refrigerated tube racks are now in service on the floor in stations 301-3, 303-10, and 305-7, the one in 305-7 having incorporated on it an automatic leak, the position of which is controlled by the output of the Pirani gage. Since the problem of designing and field testing these racks is substantially completed, a report on the project has been started.

S-219

954 TUBES IN PREAMPLIFIER (HF 201 - 177874)-

Requested by L. F. Lieber, December 4, 1946, Maintenance Division.

Problem:

To investigate the possibility of decreasing the high rejection rate on 954 tubes in the Line Recorder pre-amplifier by using a better grade tube and by improved techniques or design. (Problem restated March 1, 1947).

Progress:

This problem was inactive during the past month.

S-220

SOURCE MAGNET MOUNTING BRACKET (HF 201 - 177875)-

Requested by L. F. Lieber, December 4, 1946, Maintenance Division.

Problem:

The present mounting bracket which assembles the source magnet to the line recorder tube rack frame, and also provides means for adjustment, is too cumbersome and difficult to adjust. (Details in December, 1946 Report).

Progress:

This problem was inactive during the past month.

S-225

OPERATIONAL LIFE OF TUBE RACK (HF 201 - 177892)-

Requested by L. F. Lieber, January 6, 1947, Maintenance Division.

Problem:

Eight tube racks have been in operation for over ten months. It is felt that an investigation of these racks might reveal information which would enable the Maintenance Department to extend the lives of all tube racks.

C O N F I D E N T I A L

C O N F I D E N T I A L

PART II

A. LINE RECORDER IMPROVEMENTS (Continued)

Progress: Further data on tube rack life were obtained during the past month from the Statistics and Records Section of Instrument Maintenance. Although every effort has been made to find significant relationships between tube rack life and operating conditions or position in the cascade, no correlation is evident. It is felt that variations in tube rack life are so nearly a function of chance alone, that the pre-determined control of the variables involved so that tube rack life may be prolonged is not practicable.

S-231

MANIFOLD EVACUATION SYSTEM (HF 201 - 179804)-

Requested by A. P. Huber, January 27, 1947, Process Division.

Problem: Diversion Control dictates the necessity of revising the line recorder manifolds to keep the amount of PG piping outside the manifold to a minimum. (Details in January, 1947 Report).

Progress: Further tests were made during the month on the proposed sample tubes indicating that somewhat less than one gram of sample is withdrawn using capillary of .060" inside diameter. Previous tests on .040" capillary combined with the tests mentioned above indicate that an inside diameter of approximately .050" will be ideal. Although a capillary of this size is not available on the area, it will be called for on the Bill of Materials issued with the formal design.

S-235

LINE RECORDER SOURCE CLEANING (HF 201 - 179811)-

Requested by L. L. Forward, February 7, 1947, Instrument Division.

Problem: To determine the feasibility of developing a method of cleaning line recorder sources which will not involve disassembling the source, since the work of aligning the parts and re-assembling them after they have been cleaned is a time-consuming operation. (Details in February, 1947 Report).

Progress: Three assembled sources were cleaned using an electrolytic cleaning bath and special electrodes shaped to effectively penetrate the source cavities. Although rather violent chemical action was observed, the cleaning was not particularly effective in that although the surface contamination was considerably loosened in the bath it cannot be completely removed without the use of a soft cloth for wiping the plates. This is, of course, impossible on the assembled sources. It was noted, however, that the effect of any residual glycerin or phosphoric acid contamination on outgassing time or electrical leakage was negligible.

C O N F I D E N T I A L

~~CONFIDENTIAL~~

PART II

B. LINE RECORDER SPECIAL APPLICATIONS

S-97

SPECIAL 616 TUBE RACK (HF 201 - 22594)-

Requested by J. A. Marshall, April 4, 1946, Process Division.

Problem:

To adapt the line recorder to measure HF in the plant stream. (Details in November, 1946 Report).

Progress:

Although calibration of #2 rack was completed and put in graphical form during the month, the problem has been substantially inactive although the performance of the racks is being closely observed.

S-223

MAGNET SHUNT ON LINE RECORDER (HF 201 - 177882)-

Requested by J. R. Mahoney, June 14, 1946, Engineering Division.

Problem:

To determine the possibility of employing a magnet shunt to reduce the strength of the line recorder tube rack analyzer magnet so that the helium peak can be brought into focus. (Details in December, 1946 Report).

Progress:

Final data necessary to complete this problem have been taken and a report has been started.

C. SPECIAL INSTRUMENTS

S-133

LITTLE GENE (HF 201 - 177880)-

Requested by J. R. Mahoney, June 14, 1946, Engineering Division

Problem:

An engineering investigation is required to obtain maximum efficiency from "Little Gene" in field operation. (Details in November, 1946 Report).

Progress:

This problem has been inactive during the past month.

S-227

HF VISCOSITY BRIDGE ANALYZER (HF 201 - 177894)-

Requested by J. R. Mahoney, January 8, 1947, Engineering Division.

Problem:

To determine the improvements to be made on the Temperature Differential HF Viscosity Bridge necessary to increase its efficiency of operation.

Progress:

A weight calibration of table #2 was made and it was found that the viscosity of HF differs by considerable amount from the generally accepted figure. The Laboratory has agreed to make more refined tests of HF viscosity although the data

~~CONFIDENTIAL~~

PART II

C. SPECIAL INSTRUMENTS (Continued)

already taken effectively determines the cause of the difference between the percentages of HF in the plant stream as given by the calibrating table and the viscosity bridge. Work on the Instrument Engineering bridge has not yet been started!

D. RADIATION SURVEY INSTRUMENTS

S-224

RELOCATION OF RM-2 RATE METER (HF-201 - 177891)-
Requested by M. F. Schwenn, January 6, 1947, Process Division.

Problem:

Although the RM-2 rate meters now located in the line recorder stations are to be permanent fixtures, they are installed in a temporary manner. It is required to install them on permanent type racks and run the wiring and cabling in a neat and permanent manner.

Progress:

Tabled temporarily until investigation on use of ionization chambers is completed. Ionization chambers are at present being fabricated.

S-232

HIGH PRESSURE ARGON IONIZATION CHAMBER (HF 201 - 179805)-
Requested by S. Visner, February 4, 1947, Process Division.

Problem:

To design radiation monitors to supplement the present RM-2 rate meters. (Details in February, 1947 Report).

Progress:

A vibrator power supply has been designed and installed because of the rather short life of the dry cells which were originally used as the power supply of the amplifier. Tests of the new supply have not yet been made but it appears that its operation will be satisfactory. It has been decided that an increase in sensitivity of approximately 5 times will be needed to meet the requirement of Operations. This increase in sensitivity will be accomplished as soon as the power supply problem is overcome. The new mounting for the ionization chambers was found to be satisfactory in preventing microphonics.

S-236

MODEL 263 RADIATION METER BATTERIES (HF 201 - 179813)-
Requested by J. R. Mahoney, February 17, 1947, Engineering Division.

Problem:

To determine the advisability of replacing the high voltage batteries in the 263 radiation meter with an electronic circuit. (Details in April, 1947 Report).

Progress:

This problem was inactive during the past month.

C O N F I D E N T I A L

PART II

E. MISCELLANEOUS

S-229

POLICE RADIO REPAIR WORK BENCH (HF 201 - 179802)-

Requested by L. F. Lieber, January 21, 1947, Maintenance Division.

Problem:

To prevent police transmitters that are being repaired and tested or signal generators that are used in the repair of receivers from interfering with normal police communications. (Details in January, 1947 Report).

Progress:

The requirement that 6 volts dc at 100 amperes be supplied inside the shielded room necessitated tearing and inspecting the present rectifier unit to insure that electrostatically shielded transformers were available for supplying the current requirement. Such transformers are not readily available so that minor redesign of the rectifier unit has been found necessary. A report has been written incorporating these findings, as well as those given in last month's report, and will be issued within the next few days.

S-233

JIG FOR FORMING ION GAGE GRIDS (HF 201 - 179819)-

Requested by L. F. Lieber, May 1, 1947, Maintenance Division.

Problem:

The use of the metal ion gage on the new all metal tube racks involves fabrication of several of the parts. The problem of forming ion gage grids has given a good deal of trouble, both from the standpoint of forming and of annealing.

Progress:

A report is being written. Minor changes are called for in the design of the existing jig.

S-242

RECOMMENDATION FOR EQUIPMENT - POLICE RADIO (HF 201 - 179826)-

Requested by R. M. Williams, June 13, 1947, Maintenance Division.

Problem:

Efficient maintenance of the Police Radio Equipment requires a certain amount of test equipment and investigation is to be made to determine the type and quantity of such test equipment required.

Progress:

A good deal of time during the past month has been spent in determining what equipment is used by other organizations who do service work on frequency modulation transmitters and receivers. A Purchase Requisition has been issued for the procurement of a Ferris Signal Generator, a Lampkin Frequency Meter and a set of Millen Absorption Type Wavometers. A report will be written given recommendations as soon as time allows.

C O N F I D E N T I A L

C O N F I D E N T I A L

PART III

MECHANICAL INSTRUMENT ENGINEERING SECTION

MONTHLY PROGRESS REPORT

July-1947

A. INSTRUMENTATION CONTROL SYSTEMS

S-166

CELL DIRECT RECYCLE VALVE (HF 201 - 21532)-

Requested by A. P. Huber, September 21, 1946, Process Division.

Problem:

To investigate the possibility of eliminating the cell direct recycle valve for economy of future cell design. (Details in November, 1946 Report).

Progress:

This Special Project was inactive during the month of July.

S-230

FURGE FOR SURGE SYSTEM (HF 201 - 179803)-

Requested by M. F. Schwenn, January 21, 1947, Process Division.

Problem:

To design an instrumentation system which will accomplish automatic control of the stripping cascade including the Furge for Surge System. (Details in January, 1947 Report).

Progress:

This Special Project was inactive during the month of July.

S-240

K-131 FEED SYSTEM (HF 201 - 179821)-

Requested by M. P. Soyfried, May 6, 1947, Process Division.

Problem:

To design an instrumentation system that will automatically close a safety valve in case a leak or break develops in the line connecting the chlorine cylinders and Process Piping in the K-131 Furnace Room. (Details in May, 1947 Report).

Progress:

Several tests were made during the first part of the month which employed a Radiation Detection Meter. The amount of radiation was found to be so small as to make this type of instrument impracticable for use in detecting a break or leak in the flexible hose as follows:

- (1) Colorimeter - Several solutions have been prepared to determine which solution changes color most readily in the presence of HF. A photo-electric cell will then be used to note this change.
- (2) Electrical Conductivity Cell - An instrument is being obtained from Y-12 and as soon as it arrives, tests will be made to determine if it can be satisfactorily used to detect a line leak.

C O N F I D E N T I A L

CONFIDENTIAL

PART III

A. INSTRUMENTATION CONTROL SYSTEMS (Continued)

- (3) PH Meter - No instrument has been tested yet but it is felt that a PH Meter may be employed in detecting a change in PH of the stream after it is drawn out of the bath and condensed.

B. INSTRUMENT ACCURACY

S-11

ZEROING OF INSTRUMENTS-

Requested by E. M. Blacksher, October, 1945, Maintenance Division.

Problem:

To determine the reliability of a dynamic cell alignment so that the instruments may be checked and zeroed without shutting down the cell pumps. (Details in November, 1946 Report).

Progress:

This Special Project was inactive during the month of July.

S-70.B

PORTABLE DEW-POINT INDICATORS (HF-201 - 179816)-

Requested by N. L. Isonhour, March 31, 1947, Engineering Division.

Problem:

To develop a dew-point calibrator so that the portable dew-point indicator may be checked and zeroed by the same reference instrument. (Details in March, 1947 Report).

Progress:

Results obtained from field tests on the dew-point indicator indicated that discrepancies in dew points would occur when different individuals operated the instrument. The cause was found to be the inability of inexperienced personnel to adjust the rheostat to give the same light intensity each time. To remedy this condition, a sensitive milliammeter has been installed to read the output of the plate current of the electronic tube. It will now be possible to adjust the rheostat to give the same plate current output, thus establishing a zero point for setting the sensitivity of the instrument.

S-114-C

BUILDING DATUM ACCURACY (HF 201 - 179831)-

Requested by R. W. Levin, Process Division, in Request for Engineering Service 1106, July 17, 1947.

Problem:

To design and develop equipment necessary to determine the Building Datum pressure with a precision of ± 0.005 psi. As an error in the Building Datum pressure will cause an equal error in process pressure, it is necessary to measure the datum pressure with an accuracy of ± 0.005 psi or better for determining process inventory.

CONFIDENTIAL

CONFIDENTIAL

PART III

C. DIAPHRAGM CONTROL VALVES

S-2-C

VALVE DIAPHRAGM MATERIAL (HF 201 - 93004)-

Requested by N. L. Isehour, October 28, 1946, Engineering Division.

Problem:

To procure and test special valve diaphragm material which will withstand high ambient temperature conditions for possible use with a view to minimizing the control valve diaphragm replacement rate. (Details in November, 1946 Report).

Progress:

This Project was inactive this month. The material installed on the control valves in the K-631 building are still undergoing a six months test. This test will be completed in August.

S-228

INOPERATIVE REPUBLIC MAGNETIC VALVES (HF 201 - 179801)-

Requested by N. L. Isehour, January 16, 1947, Engineering Division.

Problem:

To develop a high torque electromagnet for use in freeing stuck Republic Magnetic Valves. (Details in January, 1947 Report).

Progress:

This Special Project was inactive during the month of July.

S-234

SALVAGE OF REPUBLIC MAGNETIC VALVES (HF 201 - 179808)-

Requested by N. L. Isehour, January 30, 1947, Engineering Division.

Problem:

To salvage those valves which have been and will be removed from the process system due to bearing sticking, so that they may be re-used. (Details in January, 1947 Report).

Progress:

This Special Project was inactive during the month of July.

S-241

VARIABILITY OF FISHER BUTTERFLY VALVES (HF 201 - 179825)-

Requested by R. G. Jordan, June 9, 1947, Process Division.

Problem:

To determine the variances of stage control valves with a view to reducing the magnitude of variability for purpose of more accurately determining process inventory.

Progress:

Estimates have been made of variances contributed by individuals setting the valves, methods used, and valve characteristics. These are being studied by Process Engineering with a view to specifying the precision and accuracy which will be required in the future. This will then determine the method which will be used for zeroing stage control valves.

CONFIDENTIAL

C O N F I D E N T I A L

PART III

D. SPECIAL MAINTENANCE PROBLEMS

S-38

SHRADER VALVES (HF 201 - 177851)-

Requested by E. M. Blacksher, November 15, 1946, Maintenance Division.

Problem:

To test redesigned Shrader Valves for purpose of recommending a means of reducing maintenance on the existing valves. (Details in November, 1946 Report).

Progress:

This Special Project was inactive this month. The special six months tests will be completed next month.

S-39

INSTRUMENT VIBRATION (HF 201 - 9033)-

Requested by E. M. Blacksher, October 25, 1945, Maintenance Division.

Problem:

To develop means of eliminating cell instrument vibration to increase their accuracy. (Details in November, 1946 Report).

Progress:

This Special Project was inactive during the month of July.

E. MISCELLANEOUS

S-119

1300 SECTION INSTRUMENT APPLICATION SHEET -

Requested by N. L. Isenhour, May 15, 1946, Engineering Division.

Problem:

To make instrument application prints of the 1300 Section as no complete set of prints are existing. (Details in November, 1946 Report).

Progress:

This Special Project was inactive during the month of July.

C O N F I D E N T I A L

DISTRIBUTION

1. K-25 Site Records (RC)
2. ChemRisk/Shonka Research Associates
3. DOE Public Reading Room
4. S. G. Thornton (K-25 EMD)